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WHOLE No. 2865

NEW YORK, SATURDAY, FEBRUARY 5, 1927.

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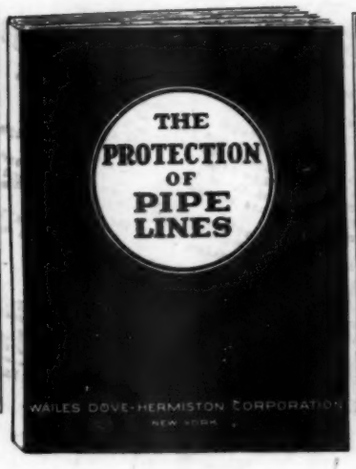
Usual method of applying BITUMASTIC ENAMEL to pipe lying beside trench



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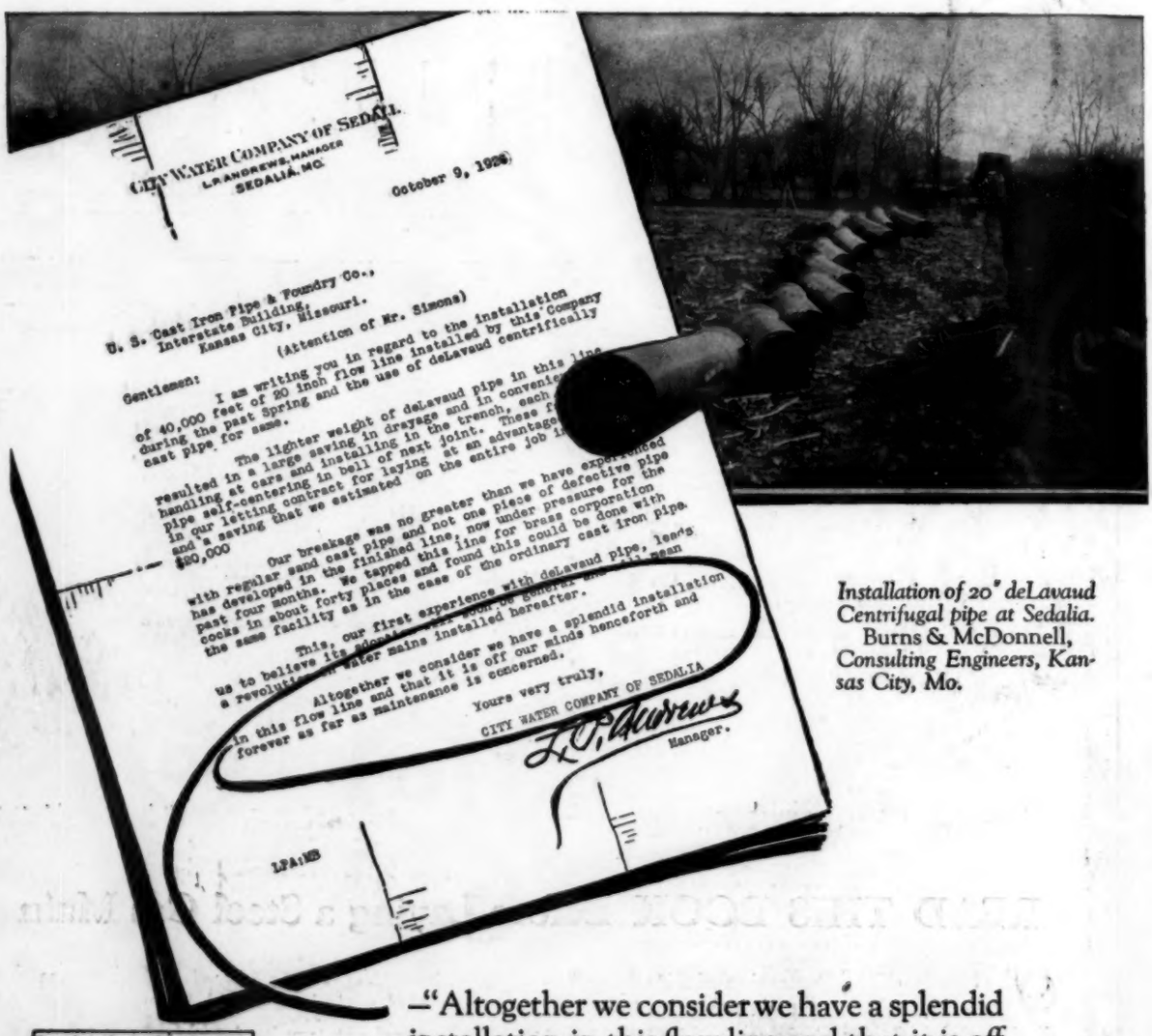

CITY WATER COMPANY OF SEDALIA
L. P. ANDREWS, MANAGER
SEDALIA, MO.

October 9, 1926

U. S. Cast Iron Pipe & Foundry Co.,
Interstate Building,
Kansas City, Missouri.

(Attention of Mr. Simons)

Gentlemen:

I am writing you in regard to the installation of 40,000 feet of 20 inch flow line installed by this Company during the past Spring and the use of deLavaud centrifically cast pipe for same.

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Altogether we consider we have a splendid installation in this flow line and that it is off our minds henceforth and forever as far as maintenance is concerned.

Yours very truly,

CITY WATER COMPANY OF SEDALIA

L. P. Andrews

Manager.

LPA:MB

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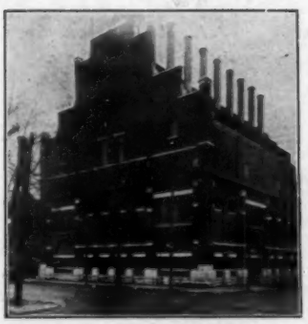

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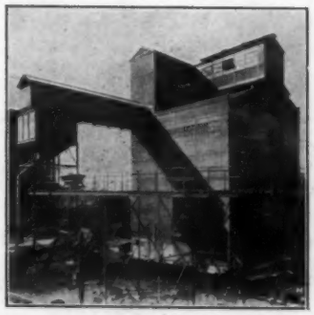

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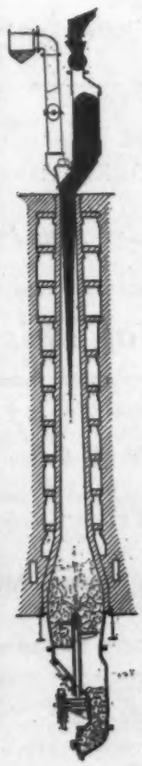

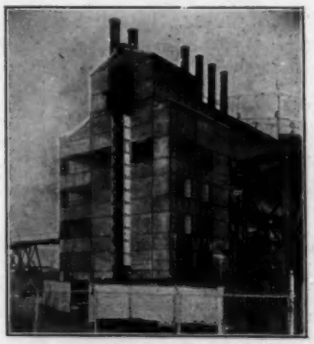

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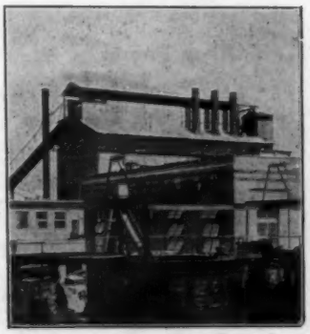

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Buenos Aires	3,500,000 cu. ft.

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Toronto, Ont. (ext.) ..	600,000 cu. ft.
Santiago, Chile	3,000,000 cu. ft.

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American Gas Journal

SIXTY-SEVENTH YEAR

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"MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS"

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AMERICAN
GAS JOURNAL

Established 1859— Pioneer of the Gas Industry

Vol. 126. No. 6. NEW YORK, FEBRUARY 5, 1927. Whole No. 3618.

The Other Point of View

The value of the community's friendship to the ili

M. S. Sloan
President, Brooklyn Edison Company

FROM my point of view, there is no business in the entire category of our present-day activities which so much needs to give constant effort and constant attention to the making of friends as do public utilities. This is pretty generally recognized in all branches of the public utility industry—so much so that in many companies and in all the state and national utility associations there is a department or bureau devoted to the study and promotion of public relations activities. In recent years so much emphasis has been placed on this subject that I have heard some public utility operators question whether the industry wasn't overstressing the point.

"After all," they have said, "there's something more to this business than public relations."

So there is—a great deal more, from one point of view. But there's another point of view, and it is that I desire to set forth.

Influence of the Community's Regard for the Utility

Production, distribution, extension of service, financing, merchandising, auditing, billing and collecting, may be said to be outside the sphere of public relations activities, if you want to look at the business that way. But actually, when you get right down to rock-bottom, is there anything in the whole field of operations of a public utility which does not affect, and is not affected by, the standing of the company in the community it serves? Isn't the problem of maintaining the friendship and respect of the people an all-embracing matter—the most important in the business, since it is so all-inclusive?

Public utilities are unlike other businesses in several respects, but they are like all others in that they have to sell something to make any money; and they have to give satisfaction in the conduct of their business or they will be in a peck of trouble constantly and run the risk of making no money. Giving satisfaction when a utility is in question is something different from giving satisfaction when dealing with a merchant is in point, and much harder. The utility sells a service. The merchant sells an article. The utility is almost always the only source of supply for that service. Half a dozen or half a hundred merchants within reach of the customer sell the same article. The utility is almost always a corporation—something the public regards as big and impersonal. The merchant may be a corporation, but if successful in business has managed to keep from becoming dehumanized and impersonal.

The Merchant's Method in Getting Customers

The utility tells the customer what he must do in order to get the service, though it too seldom tells him why; and often its own employees themselves don't understand the reason for many of its rules and regulations. The merchant by every means at his command invites customers to spend their money at his establishment, and devotes a lot of time and effort and expense to making it easy and pleasant for them to do so.

The customer pays the bills to the utility for a service he can't see, based on measurements by instruments furnished and owned by the utility, the accuracy of which he sometimes questions and can only prove by going to a good deal of trouble; and those bills are calculated in units which are only words to him. He hears of other communities which obtain the same service (so far as he knows) for less money. Wherever he lives, he hears of some community which obtains the service for less money; and it's only human for him to wonder whether he's being victimized. The merchant's customer buys something he can see and feel and put to physical use for pleasure or profit; and he pays for it a price which he knows in advance and about the justice of which he can satisfy himself.

The merchant's customer, in short, can take that particular merchant or leave him pretty much according to the customer's own liking and standards of judgment. The utility's customer has got to take the utility if he buys any service—and he takes it for better or worse because he has no choice. The utility can keep him a customer just because he feels he must be; it can convert him into a friend; or it can convert him—and only too easily—into a downright antagonist.

What advantage is it to the utility to be regarded

by the people of the community with friendship and approval? Should it do more than continue as a well-managed business or should it endeavor to impress on the community consciousness as a business definitely seeking close friendly relations with all the people whose lives it touches and affects?

The Item of Profits

First let us consider the item of profits, to use the word as it is understood by the general public. Gas and electric utilities have been particularly fortunate for a number of years in that new building and new customers and the increasing prosperity of the American people have created a great demand for service. Nevertheless they have kinds of service which require a good deal of selling, and any utility which ceases to regard itself as a selling organization —that is, a business out to make all the sales of all nature possible—is on the skids as a business and isn't measuring up to a broad conception of its job in the community. Is it easier to sell service to people who are friendly or to people who aren't? Will sales resistance and sales expense be less when people have confidence in the utility, or when they regard it as a kind of necessary evil? Under which conditions can the dollar of investment produce the greater revenue?

Obtaining New Capital

Second, let us consider the item of obtaining new capital and the cost thereof. If a public utility isn't disintegrating from dry-rot, new capital from time to time becomes essential. It may be obtained through securities underwritten by a banker or banking syndicate, or it may be obtained by selling securities directly to customers. I don't think there's any secret about the fact that bankers contemplating the handling of new securities inquire very carefully into the reputation and standing of the utility with the people in its territory and that this influences the terms on which they will undertake to handle the securities. I don't think there's any secret about the fact that very large investors in utility securities—particularly the insurance companies—are influenced in their purchases by this element. Further, in customer-owner sale of securities, the standing of the utility in its community— not alone as a sound and prosperous organization, but also on the human side —has been proved to be a pretty accurate measure of the ease with which the stock can be sold and directly affects the cost of selling it.

Rates and Franchises

Third, let us consider the item of rates, franchises for new territory, permits and kindred matters in which the utility is brought into direct contact with public officials. No utility likes or wants to raise its rates, but sometimes that becomes necessary. Will it be easier to obtain approval of a proposed rate increase from the officials if the utility has a reputation for frankness, for friendliness, for a public-spirited policy than if it hasn't? Will it be more likely if it has such a reputation, to get a franchise in new territory, or less likely? Will its dealings with public officials all along the line—in all the many contacts which a utility has with officials of every grade—be facilitated or hampered by good public relations built up carefully and conscientiously?

Effects of Morale of Utility's Working Force

Fourth, let us consider the morale of the utility's working force—the men and women in every department who carry on the routines and practices of the business. If the utility has a known policy of seeking the friendship and approval of the public, will the morale of the working force be good, or less good? Will these men and women put their utmost spirit and effort into their jobs, or will they slack? Will they, in short, be inspirited to their best by knowing the company expects their best and promises their best to the public, and the public considers it an honor to be part of such an organization; or will they slump along as time-servers and clock-watchers?

All this, perhaps, is elementary. Perhaps it is comprehended in the expression "well-managed utility." Certainly a utility cannot be well-managed, in the broad sense, unless it is paying attention to the matter of relations with the public as it affects these and many other phases of its operations.

It seems to me that whatever time and effort and money we put into the cultivation of friendly relations with the public—and by that I mean something above and beyond neutral business relations—constitute an investment. I don't believe the desirability of such investment can be overstressed. I don't think it can ever be sufficiently emphasized, because the nature of the utility business is such that there is always the need for new effort and new forms of effort to keep cordial all contacts with the public.

¤ ¤ ¤ ¤

THOUSAND GAS COMPANIES NOW SERVING 50,000,000 OF NATION'S POPULATION

There are today in the United States about 1,000 companies engaged in the manufacture and distribution of gas to approximately 5,000 cities, towns and villages. About 950 of these companies are private companies, the others are owned and operated by municipalities, says the New Jersey Public Utility Information Committee.

Those private companies have an investment of approximately $4,500,000,000 and serve about 10,500,000 customers, representing a population in excess of 50,000,000. About 400,000 new customers are added each year. It is estimated that there are more than 5,000 distinct uses of gas and that gas is used in some process in the manufacture of more than 20,000 articles.

In manufacturing appliances for utilizing gas there are about 570 companies, 244 of which manufacture gas ranges, 99 make hot water heaters, 141 make space heaters, 36 manufacture apparatus for heating houses, and 50 manufacture miscellaneous heating appliances.

The State of Existing Data on Heat Transfer Through Insulation in the Moderate and High Temperature Fields*

L. B. McMillan

Chief Engineer, Johns Manville, Inc., New York

(Continued from Jan. 29th)

3. Conductivity—A Function of Temperature

CONDUCTIVITY has already been defined at the outset of this paper, and was there shown to be a specific property, not dependent upon the area, shape or thickness of the material. It has long been recognized that the conductivities of insulating materials are higher at the higher temperatures. It is reasonable that this should be so; because, due to the porosity of their structure, heat is transferred within these small spaces by radiation, convection and conduction, in addition to that conducted by the solid particles in actual contact, and both radiation and convection increase more rapidly than the first power of the temperature.

It is well known that insulating materials owe their insulating value to the porosity referred to above, and often it is said that the air spaces are responsible for the low conductivity. That is true as far as it goes, but a more complete statement of the situation would be that it is the multitude of surface resistances at the boundaries of the air spaces which give the material its resistance to heat flow. Because of the close proximity of the warmer and cooler walls of these spaces, the magnitude of each of these surface resistances is naturally small as compared with the resistance at an outer surface, yet because of their multitudinous number the sum of all of these small resistances may result in a total resistance of relatively high magnitude. The solid material between the spaces may be relatively a good conductor of heat, yet if the physical structure of the particles be such as to provide a sufficient number of spaces with their corresponding surface resistances, the resulting product may be a very good insulation. This is illustrated by the fact that the conductivity of magnesium carbonate in the form in which it is used as an insulation is about one-thirtieth of that of the same material in solid form. An even more striking example is the case of carbon which in the form of graphite has a conductivity more than two hundred times that of carbon in the form of lampblack.

The effect of temperature on conductivity has been taken into account by different investigators in various ways. The four most common methods of expressing conductivity are as follows:

(a) As a function of temperature difference between surfaces.

(b) As a function of the temperature of the warmer surface.

(c) As a function of temperature difference between warmer surface and room temperature.

(d) As a function of mean temperature.

Since conductivity is a function of temperature and not of temperature difference, method (a) is subject to serious errors. The conductivity of a material with one surface at 100 degrees Fahrenheit, and the other at 200 degrees Fahrenheit, will be much lower than the conductivity of the same material with one surface at 500 degrees Fahrenheit and the other at 400 degrees Fahrenheit even though the temperature difference in each case is the same.

Method (b) is subject to objections of much the same character; because, while the temperature of one face is fixed, varying the temperature of the other face would cause wide variations in conductivity.

Method (c) has been found to be reasonably satisfactory so long as transfer through a single material was involved; because, since one end of the temperature difference is the room temperature, which varies over only a relatively small range, the mean temperature was fixed between comparatively close limits. However, it was not fixed absolutely, and a further objection is that, in the case of heat transfer through two or more materials in series, this method furnishes no means of evaluating the conductivity of the inner layer or layers.

Therefore, since conductivity is a function of temperature, the correct basis of expressing its value is in terms of conductivity at the mean temperature of the material, (method d). This mean temperature is the arithmetical mean of the temperatures of the two surfaces and is not the temperature at the physical center of the material.

* Presented at the Heat Transfer Session arranged by the National Research Council Committee on Heat Transmission at the Annual Meeting of the American Society of Mechanical Engineers, in joint session with the American Society of Refrigerating Engineers, 29 West 39th Street, New York City, December 7, 1926.

Carl Hering[1], and L. L. Barrett[2], have shown that where the curve of conductivity with respect to temperature was a straight line, the average conductivity for the entire thickness of material under consideration was equal to the true conductivity at the arithmetical mean of the two surface temperatures. The author has shown[3] that this relationship applies with a satisfactory degree of accuracy to conductivity curves of considerable curvature, as well as to straight lines. The average conductivity is equal to the true conductivity at the temperature

$$t=\sqrt[n]{\frac{T_1^{n+1}-T_2^{n+1}}{n+1\,(T_1-T_2}} \quad (11)$$

but the arithmetical mean of the surface temperatures closely approximates the value of this expression for a considerable range of values of n. This proof also shows that the relationship holds for either flat or curved surfaces.

Conductivities expressed in this way may be used in computations involving a given layer of material regardless of whether it is used alone or in combination with other layers of material. All that is necessary is that the mean temperature of the layer of material be known. In the past it has usually been necessary to arrive at this mean temperature by the "cut and try" method which was quite tedious. However, in his own work the author has used for several years past a method whereby the mean temperature of each layer of material in combinations of two materials may be determined graphically with a highly satisfactory degree of accuracy. This method makes the computations for combinations of two materials extremely simple and may be extended to minimize the "cut and try" required for any number of materials. However, usually there are not more than two materials of major insulating value in a given construction.

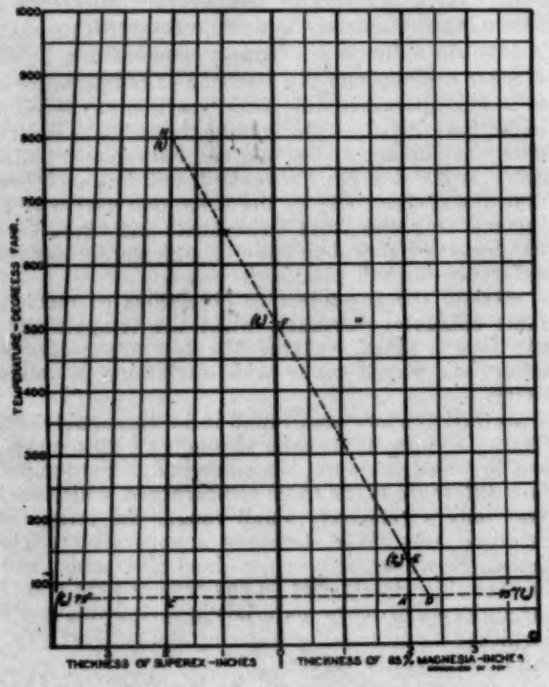

Fig. 7. Mean Temperature Chart

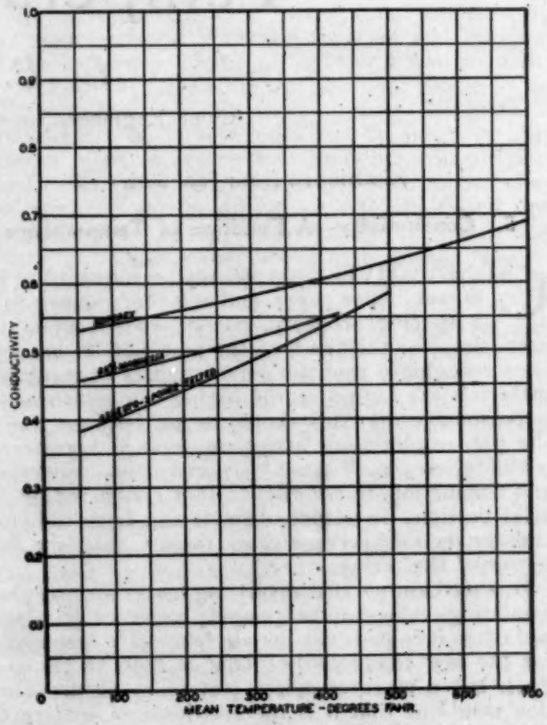

Fig. 8. Conductivities of Asbestos Sponge Felted, 85% Magnesia and Superex

The method is illustrated in the chart, Fig. 7, which is based on the conductivities of Superex[1] and 85 per cent Magnesia, shown in Fig. 8. Briefly, the chart is based on plotting the temperature gradients through the two materials using a scale of thickness for one of the materials sufficiently different from that of the other so that, when plotted, the temperature of the warmer surface of the first material, the temperature of the surface of contact between the two materials and the temperature of the cooler surface of the second material will all lie on the same straight line. Obviously if the conductivities of the materials are different, these points will not lie on a single straight line when plotted to the same scale of thickness. However, if the scales of thickness for the two materials be made in inverse proportion to their conductivities (scale for first material equals k_2/k_1 times the scale for second material) the three points will lie on the same straight line.

[1] Trans. American Electrochemical Society, Vol. XXI, page 520.

[2] Trans. A. S. M. E., Vol. 44, page 315.

[3] Journal A. S. M. E., Oct., 1924, page 603.

[1] A recent development in high temperature insulating material for temperatures from 500 to 1500 deg. Fahr.

The construction of this chart is illustrated in Fig. 9, where the actual temperature gradients plotted to a uniform scale of thickness are indicated by the solid curved lines. It has already been shown that the average conductivity for each layer is the conductivity at the arithmetical mean of the temperature of the two surfaces, and is not the conductivity at the physical center of the material. Therefore, the actual shapes of the gradients between EF and FG are mainly of academic interest and the locations of the points E, F and G are the vital considerations in the solution. The dotted line CH represents the thickness of the first material equal to OA, but plotted to a scale which will cause the three controlling temperatures to fall on a straight line.

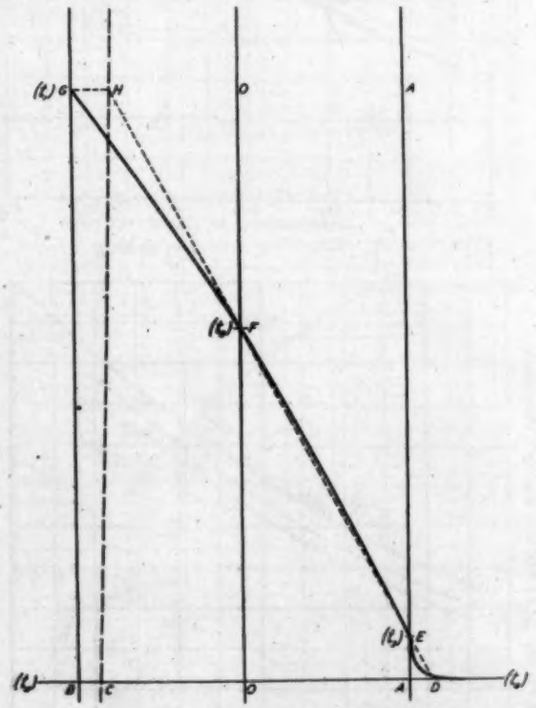

Fig. 9. Temperature Gradients Through Superex and 85% Magnesia

The scale of thickness for the second material is laid out uniformly on the right of a base line 00, which represents the dividing line between the two materials. The scale for the first material along a horizontal line representing room temperatures is laid out to the left of the base line, using a scale k_2/k_1 times that used for the first material, $OC = OA \times \frac{k_2}{k_1}$.

However, this is the only line on which the mean temperatures for both materials are the same; therefore, to determine the proper scale at higher temperatures, the relative mean temperatures for several values of t_1 must be calculated and points located as at H. The distance OH and OA are inversely proportional to the conductivities of the respective materials at their mean temperatures.

It is evident that for combinations of thicknesses other than those for which the point H was located, the mean temperatures of the respective layers, and consequently the conductivities will not be the same. However, in a given case, both temperatures will be higher, or both will be lower, so that variations are not cumulative and in actual use, errors due to the slight variations in these actual values are surprisingly small. For example, varying the proportions of the materials 100 per cent from those on which the chart is based, results in a difference of less than 0.5 per cent between actual values of conductivities and those at the mean temperatures as determined from the chart.

In order to use the chart, Fig. 7, for two materials and one surface resistance, R_s, locate point H at the point on the chart representing thickness of first material and temperature at its warmer face. Locate point A at the point representing thickness of second material and room temperature. Lay off distance $AD = R_s k_2$. Draw the straight line HD. The intersection of this line with the base line 00 gives the temperature at the boundary between the two materials. The intersection with the line representing the outer surface of the second material gives the temperature of this surface.

Where more than two materials are involved, each material other than the two for which the chart is laid out is provided for in the solution in the same manner as was illustrated above for surface resistance. The chart applies equally well to insulation on pipes and on flat surfaces. The only difference is that in the case of pipe insulation, "equivalent thicknesses" (values of $r_s \log_e \frac{r_2}{r_1}$ etc.) are used instead of actual thicknesses.

The slope of the line HD is a function of rate of heat transfer from outer surface to air. Since surface resistance is a variable which may, for a given set of conditions, be expressed as a function of the same rate of heat transfer, this relationship forms the basis for a method which long use has demonstrated to be highly convenient for eliminating the "cut and try" operation in connection with surface resistance. This method consists of placing the base line of a protractor on the line HD and reading the surface resistance directly from suitable scales inscribed on the arc of the protractor.

Still another convenient short cut in the use of the chart is based on the fact that the mean temperatures of the two layers may be read directly from the chart at the mid-points of the lines EF and FG respectively. Consequently, the use of proportional dividers set in the ratio of 2 to 1 makes it possible to obtain the required mean temperatures directly and instantly without the necessity of reading and averaging the respective surface temperatures.

The straight line HD on the chart, Fig. 7, illustrates the method of determining the temperature at the respective surfaces of 2-inch thick Superex and 2-inch thick 85 per cent Magnesia, where temperature of warmer surface is 800 degrees Fahrenheit and room temperature is 75 degrees Fahrenheit. The distance AD ($= R_s k_2$) may, for a given combination of materials and for still air conditions, be

taken as a constant without introducing appreciable error. For the combination of materials to which Fig. 7 applies this constant is 0.3 inches of the second material.

If for any particular solution the results obtained from such a chart are not considered sufficiently accurate, these results may be used as the first trial solution, and the final solution may then be accomplished with any desired degree of accuracy. It will generally be found, however, that the corrections required in this final solution are extremely small, so small, in fact, as to be rarely of practical importance.

Concluding this phase of the discussion, it may be said that there is no urgent need for an extended program of research devoted to further determination of conductivities of commercial insulating materials in the moderate and high temperature field. However, it cannot be too strongly urged that, in such results as are presented in the future, the mean temperature of the determination should be stated and above all the value reported as conductivity should actually be conductivity and not some odd combination of true conductivity with other, and extraneous, effects.

4. Surface Effects

It has already been pointed out that the investigation of surface resistance offers a most fruitful field for further research. This does not mean that information on the subject is wholly lacking. In fact, sufficient data are available for the solution of most insulation problems with a highly satisfactory degree of accuracy. However, the deficiency of the work in this field (and the author makes no exception of his own earlier published results in this connection) is that results presented are over-all co-efficients and make no provision for the separate effects of radiation and convection. One of these effects, radiation, is a function of the difference of the fourth powers of the absolute temperatures, while the other, convection, is generally considered to be a function of temperature difference. Therefore, while the results may be applied with assurance of accuracy to conditions closely approximating those under which they were obtained, they may not be extended very far beyond the range of actual experimentation.

The important effects of absolute temperature and of air velocity are too often neglected in this connection. It is generally conceded that the rates of heat transfer from cylindrical surfaces of small diameter, under still air conditions, are greater than from those of larger diameter. Paulding's[1] deductions, Fig. 10, indicated a rather wide variation in this regard. Actual experiments by Heilman[2], Fig. 11, showed a much smaller range of variation and the composite chart[3], Fig. 12, shows a close grouping of results for various diameters. In fact, it is apparent in all three charts that except for the very small pipe sizes, smaller than 3-inch, the differences due to pipe size are not large.

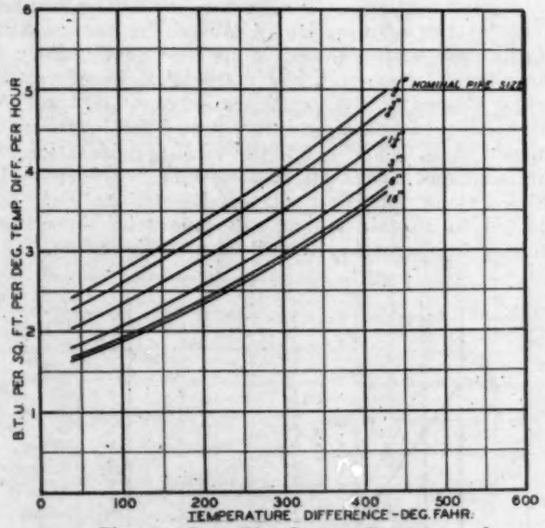

Fig. 10. Bare Pipe Losses—Paulding

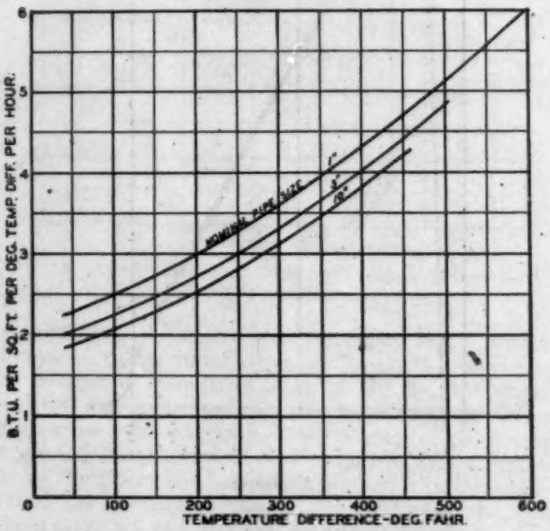

Fig. 11. Bare Pipe Losses—Heilman

An interesting feature of Eberle's tests shown in Fig. 12, is that the pipe of smaller diameter is shown to have the lower rates of loss. However, the air temperature and consequently the absolute temperatures of both the pipe and its surroundings were higher in the series of tests on the larger pipe. This undoubtedly accounts in a large measure for the peculiarity of the results.

As will be shown later, a relatively low air velocity will effect a relatively large increase in heat transfer from a surface. It is evident, therefore, that the effects of absolute temperature and of air velocity may completely overshadow the effect of pipe size.

[1] Practical Laws and Data on the Condensation of Steam in Covered and Bare Pipes, published by D. Van Nostrand Co., New York, 1904.

[2] Trans. A. S. M. E., Vol. 44, page 301.

[3] G. H. Barrus, Trans. A. S. M. E., Vol. 23, page 791; Chr. Eberle, Mit uber Forschungs-Arbeiten, Verein Deutscher Ing., heft 78; L. B. McMillan, Trans. A. S. M. E., Vol. 37, page 941; Langmuir, calculated from Equations (13) and (14).

All results on bare surface losses are to be considered as fairly convenient approximations which will serve until more scientifically complete data are available.

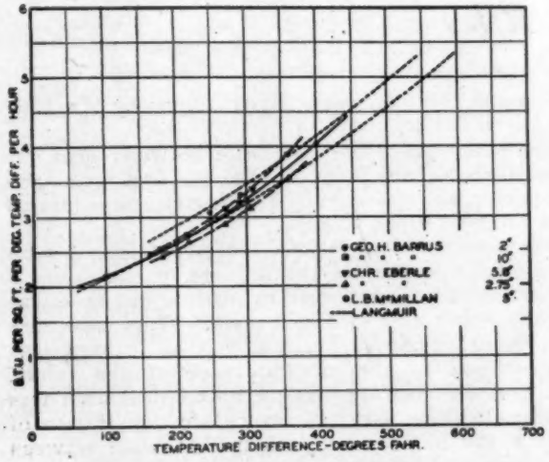

Fig. 12. Rate of Heat Transfer from Metal Surface to Air —Barrus, Eberle, McMillan and Langmuir

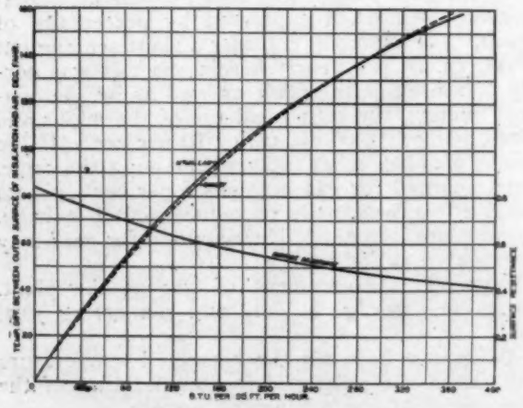

Fig. 13. Rates of Heat Transfer from Canvas-covered Insulation Surfaces to Air

The existing information on rates of heat transfer from insulation surfaces to surrounding air is in much the same state as that outlined above for bare surfaces. Fig. 13 shows results of experiments by the author[1] and by Bagley[2]. For the relationship between temperature difference, surface to air, $t_1 - t_a$, diameter D, and rate of heat transfer from surface of insulation to surrounding air, h, Heilman[3] gives the equation

$$t_s - t_a = \frac{272.5h}{h + \frac{564}{D^{0.19}}} \quad (12)$$

However, this equation is admittedly empirical and may not be used for diameters much beyond the range of his experiments. Where the surface resistance is relatively a small part of the total resistance, as it always is in the case of effectively insulated surfaces, the use of any one of these three methods permits the calculation of total rate of heat transfer to an accuracy of about 1 to 2 per cent, which is as exact as the conductivity values themselves, but even at that the use of these approximations must sooner or later give way to the use of more scientifically accurate data. At that time charts very much like those now in use will be required for specific conditions, but that will be in the nature of particularizing from the general instead of generalizing from the particular, which is the tendency of present methods.

(To be concluded in Feb. 12th issue)

[1] Trans. A. S. M. E., Vol. 37, page 956.
[2] Trans. A. S. M. E., Vol. 40, page 675.
[3] Trans. A. S. M. E., Vol. 44, page 308.

Note—Derivation of equation (11) can be supplied on receipt of request by the American Gas Journal.

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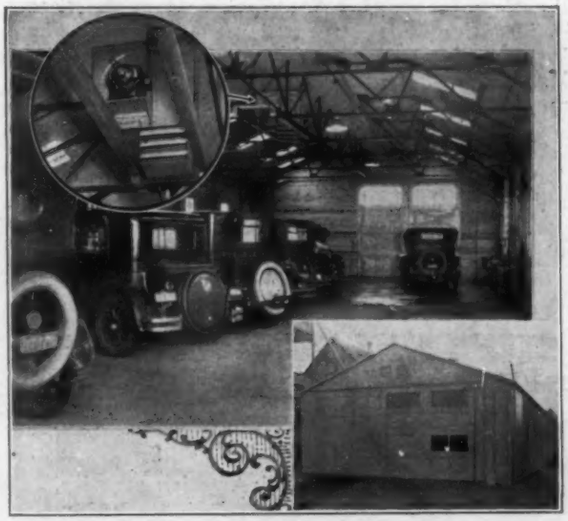
HEATING GARAGES WITH GAS

A new application of an old principle formerly used with coal, is shown in the latest gas fired installation at the garage of the American Colortype Company, 3310 North Racine Avenue.

In this instance a unit heater is suspended from the ceiling and by means of louvres or baffles, more commonly termed shutters, the heat is blown down and radiated throughout the building.

This is a most economical installation since no radiation is wasted around the building as in former cases where radiators had to be suspended above the floor, causing a considerable heat loss. Another feature is the conservation of boiler space, the room where the gas fired boiler is located being so small that the taking of a photograph was out of question. Large floor space which might have been given over to the storage of coal, is used for part of the main function of the garage—the housing of automobiles and equipment necessary for their upkeep.



New Jersey Gas Association

Annual mid-winter meeting

Henry M. Riley

THE New Jersey Gas Association convened for its annual mid-winter meeting at the Stacey-Trent Hotel in Trenton, on January twenty-eighth. Four worthwhile papers read; a discussion of the same that fairly overflowed with "nourishment;" a gathering of some four hundred gas men that quickly got under way and with "sleeves rolled up" proceeded in a business like manner to do the day's work despite the lack of ash handling facilities for the heavy smokers. A pleasant and instructive half hour's diversion was furnished immediately after lunch by way of a playlet, entitled "A Man May Be Down But He Isn't Out."

President Yetter called the meeting to order at 10:15 a. m. and in a terse but substantial manner sketched the progress of the industry and its increase in 1926, both from a national as well as the state of New Jersey standpoint. His interesting remarks included such high spots as gas house heating, hotel and restaurant cooking and the growing interest of colleges in furthering the study of gas technology. The outlook for gas refrigeration was indicated as being especially promising and the possibility of the development of long distance high pressure mains to take care of remote districts was mentioned.

Followed Mr. Yetter's remarks, Secretary Stoecker spoke, in part, of the application of one hundred and sixty-six membership since the last meeting.

* * *

TRIBUTE TO MEMORY OF L. S. BIGELOW

Immediately after Mr. Stoecker's remarks, one of the members spoke feelingly of the late Mr. L. S. Bigelow and reviewed his work and efforts in behalf of the New Jersey Gas Association, from the time of its inception almost to the day of his death. The entire gathering stood for thirty seconds in memory of Mr. Bigelow.

Immediately preceding the reading of the first paper, Mr. C. W. Berghorn extended the American Gas Association's greetings to the New Jersey Association, calling attention to the fact that the gas men should spend the better part of their time solving the problems of the present rather than worrying about the difficulties of the future.

* * *

MR. ELLIS READS AN EXCELLENT PAPER

"Increasing Revenue by Decreasing Unaccounted-for Gas" was the subject of Harry Ellis, assistant general superintendent distribution Public Service Electric & Gas Company's paper. An excellent paper and a timely contribution to distribution practice.

Some of the high spots touched upon by Mr. Ellis are given below.

For many years the difference between send out as measured at the plant and the gas sold for a similar period, as registered by all the consumers meters was referred to as leakage.

To facilitate comparisons the street mains were computed to represent the mileage of equivalent 3 inch main and the standard expression in vogue was "Leakage per mile of 3 inch main." This procedure was based on the supposition that all leakage was proportional to the circumference of the joints, which was erroneous because no consideration was given to leaking services, inaccurate registration of meters, etc., nor was any distinction made between distribution and pumping mains.

In the courses of time the term "leakage" was supplanted by the more appropriate phrase "Unaccounted for gas." Even this does not convey a comprehensive idea when expressed by percentage of send out. For example: consider a plant sending out 1,000,000 cu. ft. per year wherein the gas was correctly measured at the plant as well as by the consumers' meters, the actual leakage of the mains and services being 100,000 cu. ft., or 10 per cent. If the output is doubled, other factors remaining the same, the unaccounted for gas becomes 5 per cent, yet no physical effort was made to reduce actual leakage.

The various factors of "Unaccounted for gas" may be segregated as follows:

1—Incorrect measurement of gas at the plant.
2—Leaking storage holders and connecting yard mains.
3—Difference between the corrected temperature of the gas at the plant and the temperature of the gas measured at the consumers' meters.
4—Condensation in the storage holders and the distribution system.
5—Tapping mains and purging mains and services.
6—Stolen gas.
7—Difference between period for which send out and sales are computed.
8—Street lamps.
9—Blowing governor seals.
10—Leakage of street mains and services.
11—Slow and non-registering meters.

The amount of gas stolen is probably considerable because it is usually taken in wholesale quantities. The more common methods employed are as follows:

A—Improvised connection to the head of the service, a bold and often hazardous effort between visitations of the meter reader.

B—Removal of the meter and the substitution of a space piece between visitations of the meter reader.

C—Reversal of the meter between visitations of the meter reader. Large capacity or "A" type meters only will pass gas without registering under such conditions.

D—Concealed loops or by-passes around the meter. Such methods may escape detection for years.

E—Driving a sharp instrument through the case to puncture the diaphragm.

F—Puncturing the case within the columns below the cones. Many jobs of this character, as well as the previous case, will escape detection until the meter finds its way to the shop.

Rewarding employees for the detection of gas theft stimulates vigilance and is justifiable inasmuch as their investigations must be conducted at irregular hours and sometimes at the risk of sustaining personal injury.

The blowing of governor seals is of increasing importance.

Expansion and contraction resulting from variations of temperature, traffic shocks due to heavy auto trucks and excavations in the vicinity of gas pipe for the installation of other utilities, are responsible for most of the actual leakage. Broken cast iron mains are largely confined to 3 inch and 4 inch sizes.

Lead joints properly made have not contributed very much to leakage. Leak clamps utilizing gaskets of various materials have not proved effective. Lead wool constitutes a compact joint which finds some advocates for its employment on pumping mains. Thirty-five years employment of a cement has demonstrated its adaptability for joints on 4 inch and 6 inch mains regardless of pressures.

Steel or wrought iron mains alone are adapted for pressures in excess of 10 pounds, but they lack the durability of cast iron pipe and are limited in size.

Wrought iron and steel are very susceptible to electrolysis which is frequently the cause of prolific leakage. Insulation and banding have not effected an absolute remedy.

Special care to protect exposed threads of fittings is very essential. Many engineers favor recessed fittings.

Slow and non-registering meters form a serious phase of unaccounted for gas. Condensation and its deleterious effect on meter diaphragms is also productive of considerable loss by way of unregistered gas.

A large number of meters do not record small flows of gas, such as to pilots.

* * *

DISCUSSION OF MR. ELLIS' PAPER BY VARIOUS MEMBERS

About one-third of unaccounted for gas is due to leakage and one-half due to changes in temperature of the gas from the time it is made until the time it reaches and passes through the consumers' meters. This was brought out in a previous A.G.A. paper.

The difference in pressures at the station meters and consumers' meters will cause a large discrepancy in unaccounted for gas unless a correction is made. How far can we go with pressure on cast iron mains and how large can we make the same, are questions that will require attention in the very near future.

* * *

MAYOR OF TRENTON ADDRESSES MEETING

The discussion of Mr. Ellis' paper was interrupted for the time by the appearance of Mayor Donnelly, who, in his address, praised the service and efficiency of the gas companies in the state. H. H. Newman, division agent, P. S. Elec. & Gas Co., responded outlining the business like administration of Mayor Donnelly.

* * *

CONTINUATION OF DISCUSSION OF MR. ELLIS' PAPER

One company particularly instructs its ledger clerks to be on the alert for meters that are gradually falling off in their monthly consumption. This is largely responsible for unaccounted for gas.

It was asked whether any one ever checked the volume of fluid in the drips against the equivalent volume of gas it would represent.

* * *

J. PAUL LEINROTH'S PAPER

The reading of Mr. Leinroth's paper "House Heating Is Here—How Shall We Handle It?" commanded much earnest attention. Some of its high lights are given herewith.

We are living in a period when greater thought is being given to home comfort. The heating of homes is entering a new era.

The coal strikes have caused the public to look about for other fuels and the oil industry has seized upon this situation with considerable effect.

Whether the gas men solicit it or not, gas house heating will be forced upon them, at least to a limited extent.

From the standpoint of personnel, the man selling gas house heating should confine his efforts entirely to this phase of gas selling. He should be mechanically inclined and have real sales ability. He should have a good general idea of the manufacture and distribution of gas.

An important problem is to keep poorly designed and dangerous furnaces off the market.

In selling gas house heating we should think in terms of selling a heating service—the best that can be obtained; a Rolls-Royce service.

The heating contractor should be cultivated. Obviously he profits due to the fact that the gas company will service the job. In the case of oil burners, the servicing of the same by the heating contractor soon ate up his profit.

An estimate of the probable expense of heating a home should never be lowered in an effort to land a sale. The customer should be told the truth.

The salesman should advise against converted jobs and should always insist on automatic control.

The percentage of prospects for gas house heating obviously depends on the rates. It is not for the masses but for the middle class of good incomes. The rich are not such good prospects.

There should be used advertising with such a slogan as "Let Our Holder Be Your Fuel Bin."

As fast as it is accumulated by salesmen, solicitors, etc., the data as to the size of house, radiating surfaces, etc., should be kept in a handy tabulated form.

The customer should be well schooled in the operation of his plant and the gas company should start it off and shut it down at the end of the heating season. This service will be well worth while.

The American public values convenience and the gas industry cannot neglect such a situation. It must grasp and control the same.

* * *

DISCUSSION OF MR. LEINROTH'S PAPER

The American public will pay the price of unusual service and we should reach the class who buy, say, a machine like the Buick. Only a few companies have been able to give low rates. If we can devise some new manufacturing method or can get some way to take care of the additional plant investment in summer, it will help a lot in securing low rates for house heating.

The spare generating apparatus could be used for the manufacture of synthetic alcohol in summer. This is a substitute for wood alcohol. Such a process could be carried out for 6 or 8 months during the year.

Coke oven or coal gas plants might handle the situation but the disposition of the coke is a big problem. Where there is a combined gas and electric company, the coke can be used under the boiler. If you can get rid of the coke you can make cheap gas.

Gas house heating can be sold and it is up to the technical men in the gas industry to figure out how to make it pay. Every other industry has met and solved such problems.

One woman saved $50.00 a year on the cleaning of draperies.

It has taken 2 to 3 years to sell 1 per cent of the customers gas house heating. This is not particularly fast. Hence the need for intensive advertising. The plumber should be cultivated and after he has handled 2 or 3 installations he will in most cases come to be a booster and eventually a good salesman for the gas company.

How about the gas men using gas house heating in their homes; also every gas office that is pushing house heating should be heated with gas.

It is thought that advertising in the newspapers is an unwarranted expense.

At the conclusion of the discussion, large curve sheets were displayed, showing the rapid growth in house heating since August, 1926.

* * *

H. H. STOCKTON'S PAPER

Due to Mr. Stockton's absence, Mr. O'Neill read the former's paper entitled "How Can the Unprofitable Customer Be Made Profitable." Below are some of the paper's outstanding features.

There are many kinds of unprofitable customers who might be divided into two classes.

1st. The permanent resident connected to the mains with so little use of gas throughout one or more seasons of the year that the company cannot put him in the profitable class.

2nd. The seasonable resident who spends only a few months, say at his summer residence, but has gas available at such a place for twelve monhts.

Increasing the company's revenue from the first class is rather dependent on an intensive sales effort on the part of the New Business Department. They should make a personal contact with such customers.

As to the second class it seems that a revision of rate schedule is the only feasible solution. It is impossible to produce as much business in 3 months as from the ordinary customer in 12. This implies the need of a service charge, or some modification of it. There must be some change in the rate structure, as a matter of fact, before gas can compete with other fuels.

A service charge is unpopular due to a lack of salesmanship on the part of the gas company in general.

The gas company's unparalleled prosperity in the last few years has caused them to lose sight of unprofitable customer.

We penalize the good customer by not having a service charge. From 60 to 80 per cent of our customers are so affected.

The destiny of the gas industry is closely linked with the general trend of the economic cycle. There will be depressions and a time will arrive when there will be a demand for a scientific rate structure.

Since personal contact is needed to sell a service charge, we should select employees for this work with the utmost care.

Opposition on the part of the public to a service charge is in the minority.

* * *

DISCUSSION

There should be added another class of unprofitable customer to the two outlined in Mr. Stockton's paper, viz., the poor man, or man of moderate income who has real need of gas but cannot use same extensively on account of the high cost. He wants to use gas and this can be proven by casual investigations. Ten per cent of the natural gas customers use less than 4,000 cu. ft. of gas per month. About 90 per cent of the artificial gas users are in this class.

The question of making the gas customer more profitable is not solved to any extent by intensive sales efforts.

Optional rates are not the solution. It is easier to sell a $2.00 service charge to a crank, than a 25 cent one to an executive.

Those selling a service charge talk too much from the company's advantageous standpoint. They should talk along the line of the company having troubles of its own.

The best rate one can devise is that which encourages the use of gas with no waste and at a price within the customer's pocket book.

The answer lies largely in giving the unprofitable customer a square deal.

(Continued on page 141)

Situation Continues Satisfactory

Business remains brisk

Walter Alwyn-Schmidt

THE first month of the year has made good the promise of last year. It has not been a very eventful month and certainly has not brought any material changes in the economic situation. The weather has been favorable to the market, allowing just the right kind of cold without being unduly depressing. This has been good for the retail trade of the country and has kept merchandise moving in all retail centers. Building has kept up well and has been extremely active in the East, where the mild weather has favored building operations. The unrest in the agricultural sections of the market unfortunately is still continuing and most likely will do so, until some means are found to re-establish farming upon a more profitable basis. Agricultural bankruptcies which have been more frequent during the last year, no doubt, point to a weakness in the farming situation which demands some remedy although nobody at present seems to be willing to take any decisive action upon this most controversial subject.

Retail Trade Making Preparations for Spring Business

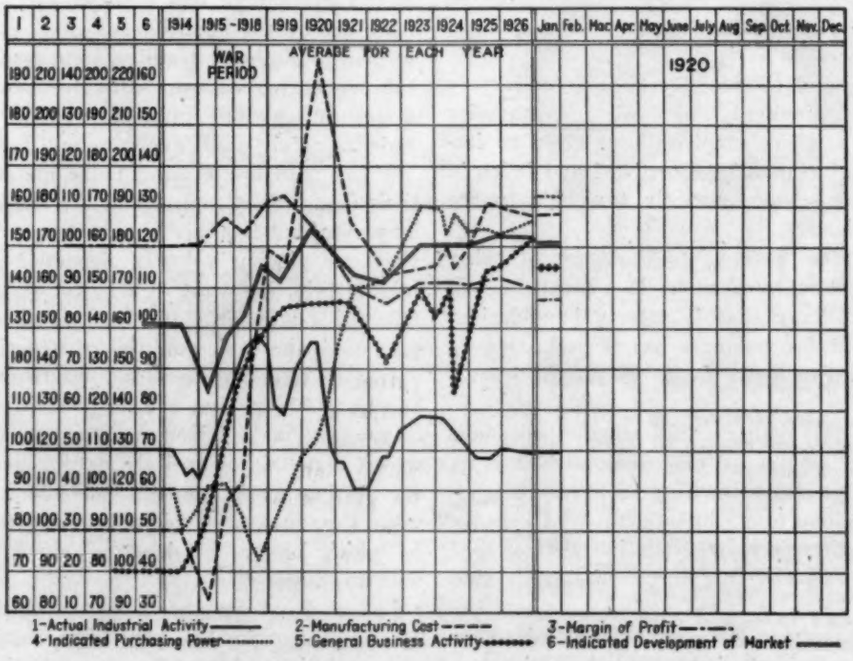
This is the period of the year when the retail trade is making its preparations for the spring business. Reports from wholesale trading and manufacturing centers of the clothing and textile industries indicate considerable activity of buyers, although orders again are kept in comparatively narrow limits. Buyers have learned to distribute their orders more carefully and to buy with an eye upon quicker turnover. This has helped to remedy the tension in the retail credit situation. But the practice of small orders, frequently repeated, has on the other hand put more stress upon the merchandise handling organization of the country. Shippers and forwarders have to deal with smaller but more numerous shipments, making necessary not only increased facilities in inland transportation but also more efficient shipping rooms in the factories and distribution centers.

The system, while favoring no doubt the purchaser and keeping more liquid the financial resources of the country, on the other hand doubtless will have its effect upon overhead and cost of handling. It favors the local distributor against the large jobbing house in the big trading centers.

Jobbers Have Drifted During Past Year

The future will show how distribution will deal with this new problem which has been realized to exist only since a short while and, therefore, has

(Continued on page 143)



As The Journal Views It

THE PERSONAL EQUATION.

Subject to correction, it might be said that the expression "personal equation" became general in its usage about twenty years ago. In the hiring of employees it is the one thing about which hinges the success or failure of the particular person for the job at hand. More, it might be considered as the susceptibility of man to rise or fall in a crisis. And that is just what chiefly concerns us in selecting an employee.

We know full well that most anyone of average intelligence can handle a particular task so long as everything moves along in the even tenor of its way. Naturally this statement is based on the premises that the person under consideration possesses the fundamentals for the work at hand. But how will the employee react and carry on at the turning point; at the fork of the road, where he or she will be called upon to display qualities far above the ordinary in order to weather through with at least a vestige of success?

Stretching far back to the dawn of recorded history the progress of mankind has shown us examples without number where empires have risen to immense power and in turn have tottered and fallen in abject decay for reasons entirely traceable to the "personal equation."

A man might be "yellow" to the point of being disgustingly intolerable when lo, in a pinch he will flame with a courage that is utterly bewildering. A veritable giant for boldness has been known to turn an utter craven in the face of unusual circumstances.

In the every day channels of business procedure this peculiar but commonplace condition also finds its counterpart. An employee with many years of successful record behind him will suddenly and without warning fail in the pinch, whereas the plodder will just as unexpectedly rise to a height of considerable proportions.

How can we rate men for a prescribed task; how can we predict sufficiently in advance how the employee will conduct himself in an extraordinary situation; in short what human factors and constants can we substitute in the "personal equation" in order to consummate its solution? Most all of us know, after a hazy fashion, what constitutes the upper and lower limits of the quantities to be substituted in the "equation" but this is banal and rather like advising some one of the height of a building by stating that it is more than fifty feet in height but not as much as one hundred and fifty feet.

With due respect to the psychologists, psychoanalysts and, better yet, employment agents, we do not believe there is any rational solution for the "personal equation." We might further qualify this opinion by venturing that we do not believe it was ever intended that puny man should encompass its solution. True enough we can distinguish and classify certain portions of the problem but only within wide and extremely flexible limits. For example it can be shown that, out of a given number of college graduates of a certain scholastic standing, such and such a percentage will measure up. We know that from out of one hundred gas employees with a prescribed preliminary training so and so many will attain executive calibre. But we cannot place our finger on any one man sufficiently in advance in order to safely predict how he will turn out.

Many men are coming more and more to cease their futile effort to arrive at the end of the rainbow by way of solving the "personal equation.". Instead they are placing a lot of dependence in what we might style, for want of a better term, the personality of a man or employee. Obviously they first pass upon the basic qualities of experience and education in selecting one for a particular occupation. But by and large they are studying closely the ability of a man to make friends and hold them; an attribute which many times entirely determines his capacity for getting work from his subordinates and at the same time measures tolerably accurately the degree to which he can be depended upon to co-operate with his superiors.

Let us have done with all our pother anent the "personal equation" and the high-sounding attempts at its solution. After all, our strength in this direction lies largely along the lines of ordinary horse sense and fortunate circumstances.

(Continued from page 138)

There should be some rate structure worked out along the line of the commutation ticket on a railroad.

The companies with a flat rate will eventually have to meet this issue.

There is a limit to how many appliances the average customer can buy.

Apartment houses will get smaller as regards room sizes and hence it is likely the gas consumption here will grow less.

In such places as negro homes it is difficult to get the housekeeper of her own volition to use more gas. It will take more time and money to convert such customers to profitable ones than any gas company would care to spend by way of publicity.

There should be co-operation with the A.G.A. in an endeavor to secure larger kitchens, have better equipment installed, etc.

The problem should be treated from the local point of view. Where there are many short time or short residence customers, a service charge is the thing.

We should get rid of hot plates and get the coal range out of the kitchen in those cases where the consumption is less than 1,000 per month.

Small housepiping and services should be replaced.

Make a study of low pressure points on the distribution system and study the ledgers in order to compile a list of low consuming customers.

In summer resorts the load factor can be increased by selling gas house heating, with the aid of attractive rates.

In some cases legislation has been against service rate charges,

In Montgomery, Ala., the former rates were $2.00 per 1,000. Then the rates were altered on the basis of $1.00 per 1,000, a service charge of $1.00 and a customer charge of $1.00; making a total of $3.00 for the first thousand. The second thousand is at the rate of $1.00 and so on. This caused an average increase in gas consumption from 2,500 to 3.400 cu. ft. per month. Before the new rates were put into effect there had been a falling off in consumption and customers.

* * *

WALTER S. R. DICKINSON'S PAPER

Mr. Dickinson indicated the following in a paper entitled "Employment and Development of Personnel."

Experts disagree on the subject and methods of hiring employees.

Observation, experience and common sense, when unaided by reliable data, are not always the best guides in selecting employees.

Psychologists are too prone to roam and amass a lot of confusing data.

All available information shows that there is no pronounced difference between blondes and brunettes.

Pure science has not been adopted in the warp and woof of business practice, although men are intensely active in reading books on the psychological aspect of selecting employees in hopes of deriving some worthwhile scientific data that can be applied in a practical sense.

As a general thing a lot of executives will pick better salesmen than the psychologists. Some of the latters' work is good, however, such as alertness and minor mental tests.

The best material is in the organization after all rather than on the outside.

The search for the right man is baffling, for others are also looking for him, and the good men are usually employed.

The gas business is different from others. It is not nation wide. Each company is concerned with serving a particular community. Hence the employees entering the industry are usually inexperienced.

The average gas man should be trained along the following lines:

1. Economics of the business.
2. Organization and Administration of company.
3. Service given by company.
4. Meter reading, billing and collecting.
5. New business.
6. Employee relations.
7. Safety.

Little was added to Mr. Stockton's admirable paper by way of discussion and the meeting was adjourned at 4:20 P. M.

Note—Those desiring to read these papers in full, kindly communicate with the American Gas Journal.

✿ ✿ ✿ ✿

Have a Heart!

DON'T expect that sweetheart of yours to keep her honeymoon disposition—cooking on a "woman-killing" old stove.

Show her you ove her as much as when you sent her Valentines by giving her a new enameled Clark Jewel Gas Range with Lorain Red Wheel Oven. Then she'll be happy.

You'll be surprised at how little it costs to give your wife hours of leisure for rest and recreation.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 155

Oil Gas

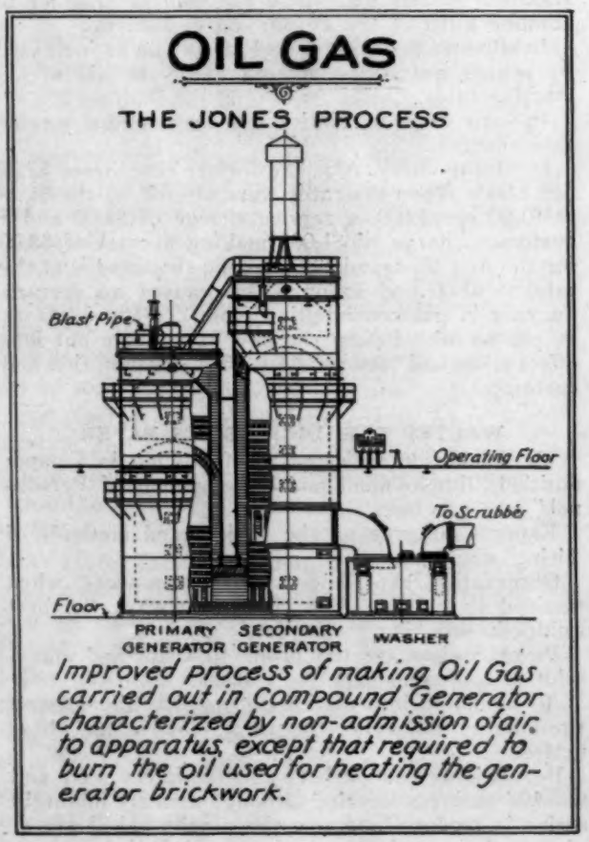
The Jones Oil Gas Process

Before leaving the subject of oil gas it would be well to spend a little time in describing the methods of making oil gas by various processes, such as the Jones and the Dayton processes. The apparatus that is used in the Jones process is shown in the accompanying illustration. The generator is a double one built in the shape of a huge U and the installation is equipped with a wash box and scrubbers. The wash box functions in the same way as the wash box in the water gas set. The interiors of both generators or rather of the compound generator is lined with suitable firebrick. There are several compartments or chambers in the generator which are filled with refractory brick supported on arches.

Description of Generator

A distinction must be made in this process between the oil that is used for heating the generator and that employed in the actual manufacture of the oil. It will be noted that the generator is a compound affair, consisting of one shorter and one longer leg, the shorter leg being on the extreme left. The oil that is used for heating is burnt in the topmost chamber, that is the first chamber of the short leg of the compound generator. Below this there is another chamber and into this chamber there is blown the oil that is used in the actual manufacture of the gas. This is called the primary make chamber. As can be seen from the figure the brickwork in this lower chamber extends all the way around to the longer leg or secondary portion of the compound generator, that is into the secondary generating chamber. Here oil is again sprayed into the apparatus for conversion into oil gas and it will be noticed that the point of spraying this oil is about the same level as the point at which burning oil is sprayed into the primary generator. At the very top of the secondary generator there is another chamber into which steam is blown. This chamber is a superheat chamber and the steam is admitted while gas is being made in the apparatus. The stack valve is located at the very top of the secondary generator.

The point at which gas is removed from the generating apparatus is some distance up from the bottom of the secondary generator. This point is just level with the top of the brickwork of the lower chamber in the primary generator. It is known that large amount of lampblack are formed during the manufacture of oil gas which is due to the decomposition of the oil with deposition of carbon. For this reason there is a large opening in the gas take-off pipe for cleaning out the lampblack which is a product of some value. The gas then passes into a wash box just like in the case of water gas manufacture, and the lampblack is also accumulated in the water. It is therefore necessary to remove the lampblack from the water which is done in a continuous filter. The lampblack problem in oil gas making is a very important one and demands strictest attention.



Improved process of making Oil Gas carried out in Compound Generator characterized by non-admission of air to apparatus, except that required to burn the oil used for heating the generator brickwork.

(Continued from page 139)

not been fully studied yet. Jobbers under the pressure of a not buying market have been inclined to drift for the last twelve months. They have been glad to get orders and, therefore, have not attempted to make any special price arrangements for the large lot buyers as compared with the smaller purchaser. If it should turn out finally that the system of small quantity buying adds unduly to the cost of handling, they no doubt will have to find some means to absorb or transfer the increased cost.

Luxury purchases have been very large during the last month of 1926, and January has had its share of the Christmas overflow. Dealers in women's dress goods are inclined to think that business in these will be very good favoring the more expensive and incidentally more gaudy lines. Silk, both for piece goods and hosiery, is having a full share of the business and the increasing prosperity of the American nation is making itself felt by a return of confidence on the side of the consumer.

Problem of Deferred Payments

The problem of deferred payments discussed during last month has in the mean time found its part-solution in the formation of a re-discount organization which will be able to broaden the risk entailed in these transactions and in so doing, doubtless, will help to minimize it. The future must show how the plan will work and in how far it will aid industry and finance in the further handling of this very important part of the nation's selling organization.

A study of the so-called key industries seems to indicate an almost complete absence of the usual New Year slackness. With the exception of certain purely seasonal groups business in these industries has kept up very much upon December levels and in some lines has even shown a marked improvement.

Banks Proceeding Cautiously

Banks generally have been inclined to proceed cautiously but it is not quite clear, whether they have been induced to do so by any mistrust in the national situation or, what is more likely, by the turn of international affairs. Conditions in China, Central America and Europe, have shown clearly that the United States, after having entered once world politics during the European war, can not afford any more to remain in splendid isolation. The interests, financial and others of its citizens, have become so closely interwoven with events in other parts of the world as to force the United States to take an active part in whatever happens to the rest of the world. While it is possible, therefore, that this country may abstain from official political action in such cases, there is no denying the fact that our banks, manufacturers and farmers have a very definite stake abroad and one which they can not afford to forget about. The purchasing power of foreign countries for American food stuffs, the need of foreign industrialists for American capital, are matters that have become suddenly most real to every American. They will affect his daily life and economic interests as much as will the affairs of a local utility or the outcome of the potato crop in Maine.

There is, however, a distinct difference in the effect of these foreign events upon national affairs as produced today as against, say, twenty years ago. While during the early years of the present century the withdrawal of even small amounts of gold from this country used to cause almost consternation in American finance, today we have built up an effective and powerful machine well able to handle our international economic affairs. We are, as in fact we have been, a part of the economic life of the world but we are today consciously so as the result of a well devised plan of international co-operation in finance and economics. This has strengthened our position materially and has made us better fit to deal with whatever are the exigencies produced by this situation.

No doubt this ability to withstand the effect of foreign economic influences is part secret of the maintenance of our economic equilibrium during the last year.

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GAS SERVICE

Puts a retinue of servants to work for you

HOW many ways are you doing it better with gas? Check up and if you're not getting your full share of benefits from gas service, see us about adequate installations of labor-saving appliances. Here's how hundreds of thousands of home owners are putting the little blue flame to work for them.

Gas Servants now do the

Cooking
Water Heating
Room Heating
House Heating
Garage Heating
Lighting
Clothes Drying
Ironing
Incinerating
Refrigerating

"If it's done with heat, you can do it better with gas."

(Your Name and Address Here)

A.G.A. 712

Specimen of A. G. A. Suggested Newspaper Cut for February

HOME SERVICE NOTES—BROOKLYN UNION GAS CO.

The Home Service Division is arranging for Friday afternoon classes for the public, in the auditorium, 176 Remsen Street. The plans for this will be announced within the near future.

Lessons in salad dressing were given at the Newtown office recently. Hindoo, tomato jelly and ring salads were demonstrated, together with the preparation of mayonnaise. Cheese wafers were the special feature of this program. The women who attended enjoyed the demonstration very much, and also relished the salads, which were passed about for sampling.

At the Williamsburgh Sub Branch, supper suggestions were presented. Jellied chicken, vegetable loaf with potato chips, stuffed celery and fairy fingers, comprised the menu.

The Girl Scouts attended a demonstration at the Newtown auditorium last week. Sixty of the scouts pledged themselves to get the family breakfast every Sunday morning for six weeks. They showed much interest in the radio program and took home with them, a number of the blotters issued by our department.

At the Williamsburgh Sub Branch, forty Boy Scouts registered and expressed enthusiasm over the course of lectures. Two of their number were selected to assist in the cooking.

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CO-OPERATIVE RECIPE DISTRIBUTION

Mrs. Farquhar writes entertainingly of her visits to twelve Broadway merchants in the vicinity of the gas store. A new clerk in an A. & P. store called to the manager, "May this lady leave these recipe sheets?" The manager answered, "Sure, we're glad to have her leave them. The women are anxious to get them."

"Are all those recipes gone which I left on your counter a few days ago?" Mrs. Farquhar inquired at another A. & P. store.

"Oh, yes, you see we drop a sheet in each customer's bag," the clerk replied.

A cashier in one of the grocery stores said, "We are glad to get the recipe sheets to mail with each monthly statement, as something especially nice for our customers."—Peoples Gas Light & Coke Co.

COOK BOOK GOES TO INDIA

Recently a woman wrote to the company in the interest of a student missionary who is to sail soon for India. He has been in this country for three years and is particularly fond of American cooking. She told him of the excellent results she had in using Mrs. Peterson's "Simplified Cooking" and he expressed so much interest that she asked for a copy for him.

Mrs. Peterson sent him an autographed copy, which delighted him, so now, "the thing I regretted to leave, is possible to me in India."—Peoples Gas Light & Coke Co.

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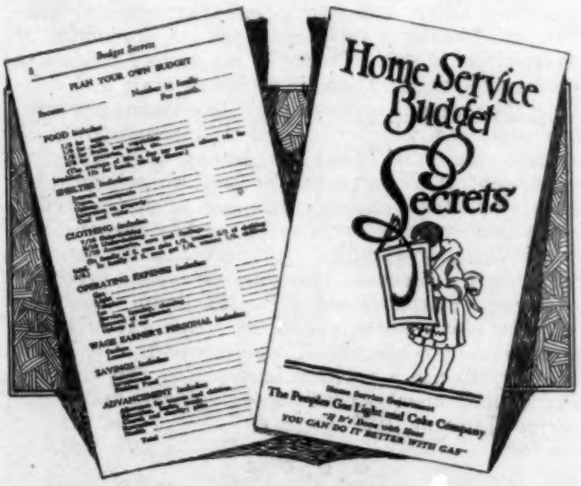
Attractive Entrance to Home Service Department of Rochester Gas and Electric Corp.

PEOPLES GAS LIGHT & COKE CO. SEND OUT 10,000 BOOKLETS

"Have you looked within the cover of this booklet which so engrosses the young lady above? We have a copy for you at the booth on the main floor, or at the Home Service office. We published 10,000 of them the first of the year, and only a few are left, for letters by the hundreds, telephone calls and personal calls have put them into circulation.


Budget Secrets
PLAN YOUR OWN BUDGET
Home Service Budget Secrets
The Peoples Gas Light and Coke Company
YOU CAN DO IT BETTER WITH GAS

"One of our girls in an outlying store said an insurance man read one of them and came back to ask for more to give to his customers, saying 'if they get the idea of how to use their money this way, they will save more money and so be able to buy more insurance.'

"The year is just a month old, all your Christmas charges are behind you. Why not apply Home Service budget secrets to make the other eleven months of 1927 the most comfortable, prosperous and happy ones you have known."

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7,500,000 WOMEN TAUGHT TO COOK BY GAS CONCERNS

Home Service Workers Give Help and Instruction to Those Who Need It; 12,000,000 Recipe Sheets Distributed

Seven and a half million women sought cooking instruction from their local gas companies in the year ending November 1st, according to figures just made public by the American Gas Association. A. B. Macbeth, president of the association, says the figures are derived from a nationally circulated questionnaire and prove conclusively that the women are not deserting the family kitchen to patronize the various dispensers of prepared food.

For the year ending October 31, the home service workers of the gas companies taught 367,299 women in specially conducted cooking classes. Almost 100,000 calls to give instruction and help in the home were made, and 306,337 telephone calls answered. Approximately 6,742,200 women were reached by cooking lectures over the radio. In addition, more than 12,000,000 special recipe sheets were distributed.

"It is ridiculous to think there is any trend away from the family kitchen and home-cooked food," states Mr. Macbeth. "Today, more than ever, the sanctity of the home is preserved, as is borne out by the figures of the number of women seeking aid in their cooking. Our survey shows that the average American is a well-fed individual because his wife, or mother, or housekeeper, is proud of the wholesome food she prepares."

The results from the questionnaire also show that the local gas company is perhaps the largest clearing house for domestic information in the world. Special requests for help in cooking are augmented by demands for diets for sick dogs, recipes for beauty creams and home brew, and helps in selling poems. One man, more than 80 years old, appealed to his gas company for help in the canning of pickled beets. The day before he had prepared ninety jars of jelly. Another request was to prepare a menu for a newly ordained priest.

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HYDE PARK GAS CO. COOKING CLASS TEACHER GIVEN CHEST OF SILVER

Weekly Demonstrations At Gas and Water Co. Offices

Concluding for the year a series of free weekly lessons and demonstrations on cooking by gas, Mrs. Ellen McCleary, the instructress, was presented by Mrs. A. C. Minck with a beautiful chest of silver, the gift of members of the cooking class during the session held at the Scranton Gas and Water Company offices recently.

The remembrance was in appreciation of the interest manifested by Mrs. McCleary in teaching the ladies of the class how to prepare and cook a great variety of foodstuffs over the period of the present year. The class united in a vote of thanks to the company for the privilege afforded the ladies of attending the course and gaining a new knowledge of cooking entirely free of all cost to members of the class.

The attendance at each weekly class session averaged 125. Another course will start shortly after the New Year. Women of the community are invited to attend.

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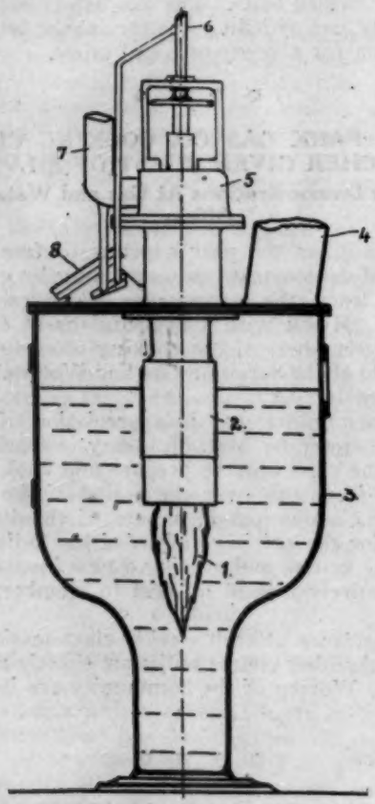
GAS RANGES NOW HAVE ALL COLORS OF THE RAINBOW

Gas ranges trimmed in all colors of the rainbow, as well as many other hues, are expected to add a note of gayety to the hitherto somber work of the kitchen. Colored ranges are said to fill a great need in the kitchen of America's modern homes. The American homemaker likes to invite her friends into the kitchen instead of closing the door, is the theory of those who have developed this innovation in keeping house.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

THE BRUNER FLAME AND INDUSTRIAL APPLICATIONS

THE Bruner flame is an outcome of the attempt to reduce losses in the boiler and in other fuel burning apparatus by removing the interposition of a wall of metal through which the heat has to be transmitted and burning the fire in immediate contact with the water in the boiler or the medium which is being heated. The accompanying illustration shows the manner in which this is done.



THE BRUNLER FLAME

The flame 1 issues forth from the burner 2 which is located below the surface of the water in the steam boiler 3, in which there is produced a mixture of steam and gaseous products. The steam gas mixture is removed through the outlet 4 and is led to a suitable receiver. The regulating valve for the mixture of fuel and air is shown at 5, the fuel being supplied by the pipe 6 and air through the pipe 7. The correct quantity of air is admitted in the regulating valve to ensure complete combustion of the fuel and the pressure of the mixture is slightly above that in the generator. The size of the flame and the quantity of steam produced can be regulated by turning the regulating valve. It is figured out that for every kilogram of oil burnt in this burner the net production of horsepower is 4.2. There is no smoke nor is a chimney required. There is no boiler scale and softening the water is unnecessary. The steam gas mixture produced which consists of approximately 50 per cent steam and 14 per cent of carbon dioxide and 36 per cent of nitrogen can be used in reciprocating engines and turbines, no condenser being necessary.

The Bruner flame can also be used in evaporators. Practically any chemical solution can be concentrated by this process. This applies to such products as sewage waste, chemical waste liquors and the like. The low temperature of the steam gas mixture, approximately 80 degrees C also means that it is not necessary to use a vacuum in applying this process to various chemical operations.—Engineers and Engineering, January, 1927, pages 8-9.

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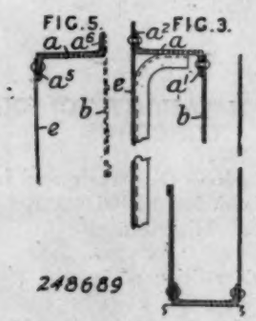
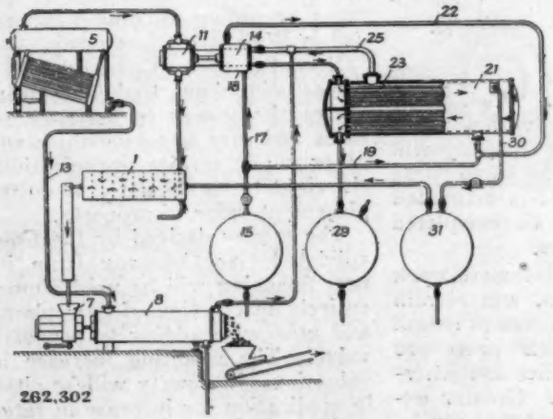
GAS HOLDER

THE dip portion of telescope gas holders consist of a skirting b connected to the side sheeting e by a roofing over plate a having a depending flange a^1 or a^5 at one edge and an upstanding flange a^2 or a^6 at the other so that the depending flange can be riveted to the skirting or outer sheeting at the factory leaving only the upper flange to be permanently attached during the erection of the gas holder. Gaps may be formed in the upstanding flanges to allow for water of the seals to overflow. In a modified construction the depending flange is formed by an angle section which is riveted along one edge of the plate a and the upstanding flange by part of a T section riveted along the other edge.—British Patent No. 248,689.



CARBONIZING COAL AND CRACKING OIL

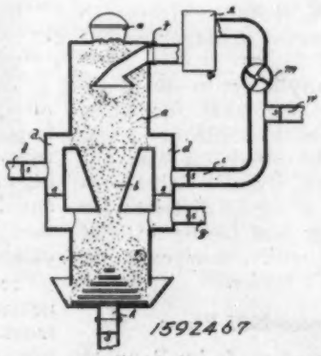
THE process is for the production of smokeless solid fuel and liquid motor fuels. The solid fuel is obtained by mixing finely pulverised coal with the oil residue obtained when evaporating crude or fuel oil. This residue must contain a high percentage of asphalt or carbon so that the mixture with coal will bind together when baked, but not by simply briquetting and cooling. About 40 to 80 per cent of the residue should vaporize on baking.



The coal and oil are mixed in a vessel 1 and exhaust steam is admitted from a boiler 5 through an oil vapor compressor cylinder 11 to the vessel 1. The mixture passes to a hopper 7 and thence to an oven 8. The fuel is there treated with hot gases from the boiler 5, which are admitted through a pipe 13. Crude oil is fed from a tank 15 through a pipe 17 to the jacket 18 of the oil vapor compressor cylinder 14 to control the temperature and pressure, but the main portion of the oil passes through a pipe 19 to the heat exchanger 21, to which the oil from the jacket 18 is also passed through a pipe 22. The tubes 23 receive the cracked and heated oil vapor from the compressor 14. Most of the liquid entering the heat exchanger is vaporized, and the vapor passes through pipe 25 to the compressor where it is subjected to a very high adiabatic compression which causes cracking. The cracked vapor condenses in the tubes 23, and the condensate is collected in a receiver 29. The oil supplied from the vessel 15 is maintained under vacuum to lower its vaporizing point. The unvaporized heavy oil, tar, pitch, etc., is continuously withdrawn through a pipe 30 to a receiver 31 which supplies the mixing vessel 1. The temperature in the heat exchanger 21 is 500 degrees to 600 degrees F. and the temperature in the oven 8 is 650 degrees to 700 degrees F. The pressure in the compressor 14 is about 100 pounds per square inch.—British Patent No. 262,302.

DISTILLING SOLID BITUMINOUS FUELS

UNITED STATES Patent No. 1,592,467 is concerned with a process for the distillation of solid bituminous fuels which is accomplished with the aid of a stream of hot gases. The fuel is distilled first to form a distilled vapor and a combustible residue. This residue is then gasified to form a hot gas and into this hot gas is introduced a regulated amount of gas of substantially the same composition as the hot gas. The mixed gases are then introduced into the bituminous fuel to perform the distillation.



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FRICTIONAL RESISTANCE IN GAS MAINS

INTERESTING tests were conducted under the auspices of the Swiss association of gas men on a length of main, 3,498 meters long. The heating value of the gas and its specific gravity were determined at both ends of the main and the quantity of gas flowing through the main was measured at the beginning by means of two parallel connected station meters and at the end in a gas holder, in which the temperature of the gas was controlled by thermo elements, while the height of the lifts was read off at different time intervals. This method of measuring the gas avoids any errors due to temperature changes. The gas was also analyzed. The co-efficient of friction was calculated from the data given below:

Dimeter of main d=0.10 meter.

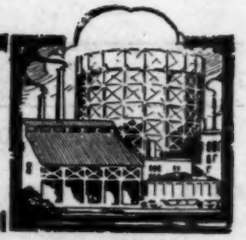
Delivery of gas Q=571.7 cubic meters per hour (0° C, 760 mm. pressure).

Specify gravity S=0.443.

Main Measured	Beginning	End
Temperature, ° C	12.0	11.1
Pressure in m.m. Hg.	636.7	221.
Absolute pressure in m.m. Hg.	1362.6	947.2
Speed in cubic meters per second ...	11.70	16.82

The co-efficient of friction determined by various formulae varied from 0.0182 to 0.0226. (Monats Bulletin No. 5.)

NEWS OF THE GAS INDUSTRY



Gas Company Plans Refund

Will Return Approximately $450,000 in Deposits; to Spend 7 Millions

Detroit, Mich.—A refund of approximately $450,000 will be sent out to about 50,000 customers of the Detroit City Gas company within 90 days, it was announced by Charles W. Bennett, vice-president and general manager of the company.

The company plans to spend approximately $7,620,000 for plant betterment, office facilities and new service to the public, it was announced. The city also will be redivided into 10 or 12 districts for meter reading and billing instead of the three which now exist on the company's books.

Announce 1927 Plans

The statement made by Bennett follows:

"The Detroit City Gas Company plans for 1927 the installation of approximately 225 miles of mains, 26,000 new services and the connection of 34,000 meters, with other miscellaneous items at a cost of about $4,300,000. This expenditure will of necessity be increased if conditions should develop warranting it.

"Plant betterments have been arranged for the year 1927, consisting of a 10,000,000 cubic foot holder, with power plant and pumping equipment, in the northwest section of the city, a similar holder and equipment in the northeast section, storehouses and shop in the west, northwest and northeast sections of the city, with other miscellaneous items, all at a cost of $2,770,000.

"In addition to the above, office facilities are now being practically doubled at a cost of about $550,000.

"In accordance with the request of the city made through Charles P. O'Neil, corporation counsel, the Detroit City Gas Company is preparing to refund deposits to customers who have established satisfactory credit with them. These deposits were made to secure credit in accordance with universal practice—the gas company paying five per cent interest on such deposits.

Will Refund $450,000

"The total amount which it is estimated will be refunded to about 50,000 customers, in accordance with the above arrangement, is approximately $450,000, including interest.

"As soon as the plan can be definitely worked out, which it is hoped can be done within about two weeks, the gas company will begin sending out checks to those entitled to them. It is estimated that refunding can be completed in about ninety days.

"It is hoped that customers, upon hearing of this plan, will refrain from coming to the office to obtain the refund, as such procedure would congest the office and otherwise occasion delay. Greater expedition in making refunds can be obtained if this matter is handled by mail.

"In accordance with the request of the city through Mr. O'Neil, the Detroit City Gas Company is also preparing to increase the number of districts into which the city is now divided for meter reading and billing purposes. Under the new arrangement the city will be divided into from 10 to 12 districts, whereas at present, there are but three districts. This procedure will relieve congestion in the various offices and enable gas company customers to transact their business with greater comfort.

"This re-districting procedure will be arranged for as promptly as possible and customers will be given advance notice of any change in the time of payment of bills."

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New Bond Issues

New York, N. Y.—An offering of $15,000,000 in 5 per cent debentures of the new Solvay subsidiary, to be known as the Solvay American Investment Corporation, is expected in the near future. Part of the proceeds of this financing will be used to retire the $10,000,000 Solvay secured 6s due in 1924.

CONSOLIDATED PROJECT HINTS HIGH GAS RATE

$115,000,000 Stock Deal Will Build Plants; Company Entitled to 7 Per Cent Return

New York, N. Y.—New financing, amounting to $115,000,000 or more, to be announced by the Consolidated Gas Company will open the way for another increase in gas rates, according to opinion expressed in Wall street last week.

Recent Supreme Court decisions, it was pointed out, took away from states the power to legislate on rates and give gas companies and other public service organizations the right to earn 7 per cent on replacement value of property.

The money derived by the Consolidated Gas Company from its new financing will be used almost entirely in erection of new plants and otherwise adding to property value. The resulting increase in valuation of property will be cited in application for increase in rates which, it is reported, shortly will be filed with the public service commission.

To Retire Stock

Close to $17,000,000 of the money raised by the new financing will be used to retire the outstanding 6 per cent preferred stock. This stock was sold to consumers in 1923 on an attractive basis. At that time there was considerable agitation about gas rates, and it was felt that consumers who were stockholders would not complain unduly about an advance in rates.

The new financing, it is reported, will take the form of 1,250,000 shares of cumulative preferred stock of no par value. It is expected it will be offered to holders of the common stock of the company at $92 a share, giving each stockholder the right to subscribe to one new share of preferred for every three shares of common stock owned.

$530,000,000 Now

On completion of the financing and retirement of existing preferred stock, the capitalization of Consolidated Gas will amount to over $530,000,000, consisting of the 3,600,000 of no par value common shares selling at $105 a share, the $115,000,000 new preferred and $50,000,000 debentures.

Mc Carter Medal Awarded

Mrs. Susan McCoy Saves Life of Neighbor

Brooklyn, N. Y.—Mrs. Susan McCoy was awarded a medal by the American Gas Association Executive Committee, for the saving of a life from gas asphyxiation. Mrs. McCoy is the wife of John H. McCoy, an employee of the Holder Distribution Department of the Brooklyn Union Gas Company.

Mr. McCoy was taught the Schaefer Prone Pressure Method of resuscitation by the accident prevention committee of the gas company, and passed on his instructions to his wife, so that she became proficient in this science.

On December 6, 1926, Mrs. Cornette Faleme, of 476 State Street, Brooklyn, N. Y., was overcome by gas in her apartment.

Mrs. McCoy who resides at 474 State Street, on hearing cries for help coming from the street, hastened outside and was informed by a young man that his mother had been overcome by gas. She asked this man to show her where his mother was. He directed her to the top floor of 476 State Street, where, in a room, she found Mrs. Faleme lying on the floor, alongside of a couch. Mrs. Faleme was unconscious.

Mrs. McCoy immediately placed the victim on her stomach and started to apply the Schaefer method of resuscitation. When she started to work on Mrs. Faleme, it appeared as though the victim was not breathing at all, but after working over her for about five minutes, she started to breathe. After working over her for about ten minutes, there was noticeable signs of life and Mrs. McCoy, together with the son, carried her out into the hallway, when an ambulance and emergency crew arrived and took charge. At this time Mrs. Faleme, to all appearances had been completely revived.

Thomas N. McCarter, president of the Public Service Corporation of New Jersey, offers these medals each year, to any man in the gas industry, who saves a life by the Schaefer Prone Pressure method of resuscitation.

After Mrs. McCoy had saved the life of her neighbor, the American Gas Association was communicated with and the facts stated to them. They at once got in touch with Mr.

Mrs. Susan McCoy

McCarter, who expressed his willingness, in making an exception in this particular case. Thereupon, the executive board of the American Gas Association, unanimously authorized the award of a McCarter Medal to Mrs. McCoy.

Over four thousand men and women employed in the Brooklyn Union Gas Company have a working knowledge of the Schaefer Prone Pressure method of resuscitation. They have passed this information on to their immediate families, so that in the neighborhood of 10,000 people are ready to assist in the reviving of any person, overcome by any cause whatsoever.

During the last year, fourteen lives were saved by employees of the Brooklyn Union Gas Company.

* * *

Mays Landing Likely to Get Gas Service

Mays Landing. — Following efforts made by Mays Landing citizens to have city gas piped into the town, the Atlantic City Gas Company has applied to the Hamilton township committee for a franchise to lay and maintain pipe lines under the streets for a period of fifty years. February 21 has been set for a hearing and it is believed that there will be no oppoition to the move, as property owners have been very anxious to secure gas service.

Gas Wells All Losing Pressure Manager Says

Perry, Wyo.—The forty-one gas wells of the Pavilion Natural Gas Company rapidly are drying up and it will be only a question of time when this locality will have no more natural gas in commercial quantities, according to Robert I. Thompson, general manager of the company.

Recent tests made on two wells show that one is producing only 3,500 and the other only 4,500 cubic feet daily, though originally either well was capable of producing at least 200,000 cubic feet. This decrease also is true of the other 39 wells, Mr. Thompson states.

The company has spent thousands of dollars in drilling new wells and bailing out old ones, installing pumps and using other recognized methods to maintain the supply. Nothing has been accomplished along this line and the company has decided against further expenditure of money in this way.

Mr. Thompson believes that all of the wells will be abandoned in the future and that manufactured gas will be the only available supply. Good progress is being made on the new plant at Pavilion but it probably will be spring before commercial quantities can be manufactured. The Pavilion National Gas Company supplies many villages in this locality with gas.

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Rome Gas Firm Ordered to Make Improvements

Rome, Ga.—To insure citizens of Rome, Ga., "continuous, reasonable and adequate gas service," the state public service commission has ordered the Rome Municipal Gas Company to install a complete duplication of the company's present booster blower system, James A. Perry, commission chairman announced.

A booster blower system was ordered by the commission following the hearing of the complaint by Rome citizens of inadequate gas service several weeks ago. A second system will be installed so that the gas service may not be interrupted in case of a breakdown of the original system, Mr. Perry said.

Credit Loss 500 Million Last Year, Says Tregoe

New York, N. Y.—The nation's credit losses of all kinds in 1926 were placed at approximately $500,000,000 in a statement made today by J. H. Tregoe, executive manager of the National Association of Credit Men, who said further that careful examination of last year's losses shows the 1926 total to be at least $100,000,000 under the 1925 figure.

Referring to the figures of R. G. Dun & Co., who place the number of last year's commercial failures at 21,773 with a total indebtedness of $409,232,278, Mr. Tregoe said that the compilations of mercantile agencies do not include a source of heavy failure losses in the handling of receivables.

"This is the cost of collecting slow accounts," he said. "It amounts to many millions annually; and there is also the loss occasioned by throwing upon the market large amounts of distressed merchandise."

Of bank failures, he said, "We have not taken into the calculation the cost to our capital of bank failures. The same pressure we run across in the production and marketing of goods we find too frequently in banks, which put out funds for speculative purposes or take receivables that are not acceptable for rediscount purposes. It is easy to get such receivables into a frozen condition; and I judge that throughout the body of banking these days too many receivables have been accepted which in a pinch could not be used for rediscount purposes."

Mr. Tregoe said that a great many failures of 1926 were of small concerns which were edged out by competition they could not withstand, or which hung on until they "went over the cliff."

"The real lesson of failure losses in 1926," he said, "is not the huge total, but the fact that at least $200,000,000 could have been saved by the exercise of preventive tactics.

"Until we think more of the fellow who buys from us, and less of the goods we are selling, this preventable loss will not be cut down; and I can't see the economy of producing and marketing goods when no profits will be made; when, after all, the merchandise will be thrown on the market to circulate at distressed prices and increase production problems.

"The open account as a credit instrument is one of the chief causes of our failure losses, because it is not usable of itself except when disposed of at usurious figures.

"There is every reason for our production, marketing and credit executives to ponder over our monumental credit losses. But for the credit technique observed by many credit departments, and the protection which we are constantly throwing around receivables, the losses would be even more staggering.

"In 1898, credit losses were approximately three hundred millions, and as we have increased our commerce five-fold since that time, it can be easily imagined what the losses would be if they had increased in equal proportion. By exercising more prudence and more restraint, it will be easy to cut down our credit losses further."

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Gas Device Cuts Fuel Bill Third

Los Angeles, Cal.—Kitchen operating costs at the new Good Samaritan Hospital, now nearing completion are expected to be cut materially, owing to the installation of up-to-date ranges, equipped with a new type gas burner, which during tests has shown a saving of approximately thirty-three and one-third per cent in fuel consumption.

Five sections of French type hotel range, manufactures by the Madsen Iron Works of Los Angeles, are being installed by the Parmelee-Dohrmann Company, each section being equipped with the new syphon burner. This burner has excited great interest among persons interested in the operation of ranges on a large scale, owing to its economy.

35 Per Cent Gas Increase Asked

Los Angeles, Cal.—An increase of 35 per cent in the gas rate in its western district was asked by the Southern Counties Gas Company in an application filed with the State Railroad Commission. The western district is made up of Santa Monica, Culver City, Barnes City, Sawtelle and Palms.

In its application, the gas company stated that after January 27, it would serve natural gas in that district, and that therefore the increase in rates will not affect the consumers, because natural gas has 35 per cent more heat value than the mixed gas now being served. The rate increase is the same as that allowed by the Railroad Commission to the Los Angeles Gas and Electric Company and the Southern California Gas Company for natural gas.

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Directors Named By Gas Company

Spokane, Wash.—Fourteen Spokane men and four New Yorkers were elected trustees of the Spokane Gas and Fuel Company at the annual stockholders' meeting.

The trustees, all of whom have served previously, will meet in the Davenport hotel and officers for 1927 will be elected. James L. Stone, company manager, then made his annual report.

Trustees elected are: Henry L. Doherty, Thomas I. Carter, W. Alton Jones and R. E. Burger, all Cities Service leaders of New York; James L. Stone, manager of the local company; W. C. Coakley, Roy A. Hoffman, A. A. Salmon, Ben H. Hoke, Charles Jolley, M. W. Thernes, W. V. Stenton, R. R. Rogers, W. H. Farnham, Harlan I. Peyton, James S. Ramage, Ben H. Kizer and Frank M. Smith.

Election of these trustees insured election of the following officers of the company:

Henry L. Doherty, president; T. I. Carter, vice-president; James L. Stone, vice-president, general manager and treasurer; M. W. Thernes, secretary; T. A. Wallace, assistant treasurer; E. E. McWhiney, assistant secretary.